Executive Engineer,
Yelahanka Division,
Bruhat Bengaluru Mahanagara Palike

Quality Control Reports

(FIFTH and PART)

Name of the Package:

Restoration and Improvements of Roads from Doddaballapura Main Road to Nagarjuna College, Kaveri Layout, Chowdappa Layout, Maruthinagara, Hariraja Layout and Surrounding Areas in Ward No - 03 of Yelahanka New Town Sub Division (PACKAGE NO -12)

AGENCY: Sri. H Srinivasa Reddy

Estimate Cost: 1000.00 Lakhs

Project Management Consultants:

SAPIENCE CONSULTANTS AND ENGINEERS, BANGALORE.

#B9-003, GANGA, Jnanabharathi Enclave, Valagerahalli, Mysore Road Bangalore 560056

Ph: 080-29523634; E-Mail: SAPIENCEBANGALORE@GMAIL.COM

BRUHAT BENGALURU MAHANAGARA PALIKE

Yelahanka Division

QC Reports

Name of the Package:

Restoration and Improvements of Roads from Doddaballapura Main Road to Nagarjuna College, Kaveri Layout, Chowdappa Layout, Maruthinagara, Hariraja Layout and Surrounding Areas in Ward No - 03 of Yelahanka New Town Sub Division (PACKAGE NO -12)

Agency: Sri. H Srinivasa Reddy

PMC: Sapience Consultants and Engineers

A.E: Sri. Ramakrishnaiah

A.E.E.: Sri. Sachin

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Email: sapiencebangalore@gmail.com

Project Management and Consultancy Services

Summary of Frequencies of Field and Laboratory Tests Conducted

Project Name	Restoration and Improvements of Roads from Doddaballapura Main Road to Nagarjuna College, Kaveri Layout, Chowdappa Layout, Maruthinagara, Hariraja Layout and Surrounding Areas in Ward No - 03 of Yelahanka New Town Sub Division (PACKAGE NO -12)
Client	Executive Engineer, Yelahanka Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-5/BBMP/YHK/2022-23/54 Dt. 25/07/2022
Contractor / Agency	Sri. Sreenivasa Reddy
Mix Type	Wet Mix Macadam

Sl. No.	Test Details	Quantity in m^3	Frequency of Tests	Tests Required	Tests Carried Out
1	Aggregate Impact Value	198.54	1 Test / 1000 m^3	1	1
2	Combined Flakiness and Elongation Indices		1 Test / 500 m^3	1	1
3	Aggregate Gradation		1 Test / 200 m^3	1	1
4	Atterberg Limits		1 Test / 200 m^3	1	1
5	Density of Compacted Layer		1 Test / 1000 m^2	1	1
6	Rate of Spread of Primer Coat		2 Tests / Day	1	1

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Sapience Consultants and Engineers,

Assistant Engineer

Contractor / Agency

Assistant Executive Engineer
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ಯಲಹಂಕ ನವನಗರ ಉಪವಿಭಾಗ,
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Aggregate Impact Value

Project Name	Restoration and Improvements of Roads from Doddaballapura Main Road to Nagarjuna College, Kaveri Layout, Chowdappa Layout, Maruthinagara, Hariraja Layout and Surrounding Areas in Ward No - 03 of Yelahanka New Town Sub Division (PACKAGE NO - 12)
Client	Executive Engineer, Yelahanka Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-5/BBMP/YHK/2022-23/54 Dt. 25/07/2022
Contractor / Agency	Sri. Sreenivasa Reddy
Mix Type	Wet Mix Macadam
Material	Coarse Aggregates
Test Method	IS : 2386 (Part - IV) 1963
Source / Location	Plant
Sample No.	1
Date	9.07.2022

Sl. No.	Details	Test No.		Average Aggregate Impact Value
		1	2	
1	Weight of Empty Cylinder (in gms) W1	1967	1967	20.50%
2	Weight of cylinder filled with sample (in gms) W2	2478	2492	
3	Weight of Sample (in gms) = (W2 - W1) W3	511	525	
4	Weight of Sample passing through 2.36mm IS sieve after impact (in gms) W4	105	105	
5	Weight of Sample retained in 2.36mm IS sieve after impact (in gms) W5	406	420	
6	Aggregate Impact Value in Percentage	21.00%	20.00%	

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 30% (MORTH table no.500.16)

For Sapience Consultants and Engineers,

SAPIENCE CONSULTANTS & ENGINEERS Bangalore-59 Authorized Signature

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Aggregate Particle Shape

Project Name	Restoration and Improvements of Roads from Doddaballapura Main Road to Nagarjuna College, Kaveri Layout, Chowdappa Layout, Maruthinagara, Hariraja Layout and Surrounding Areas in Ward No - 03 of Yelahanka New Town Sub Division (PACKAGE NO -12)
Client	Executive Engineer, Yelahanka Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-5/BBMP/YHK/2022-23/54 Dt. 25/07/2022
Contractor / Agency	Sri. Sreenivasa Reddy
Mix Type	Wet Mix Macadam
Material	Coarse Aggregates
Test Method	IS 2386(Part I) 1963 (RA 2011)
Source / Location	Plant
Sample No.	1 and 2
Date	09.07.2022

Sl. No.	Test	1	2	Requirements as per MORTH 5th edition table no 500.16
1	Flakiness Index	14.60	14.00	Maximum allowable Combined Flakiness and Elongation Indices for Dense Graded Bituminous Macadam is 35% as per Table 500.8 MORTH Specification.
2	Elongation Index	13.30	12.70	
3	Combined Flakiness & Elongation index	27.90	26.70	

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Field Density by Sand Replacement Method

Project Name	Restoration and Improvements of Roads from Doddaballapura Main Road to Nagarjuna College, Kaveri Layout, Chowdappa Layout, Maruthinagara, Hariraja Layout and Surrounding Areas in Ward No - 03 of Yelahanka New Town Sub Division (PACKAGE NO -12)
Client	Executive Engineer, Yelahanka Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-5/BBMP/YHK/2022-23/54 Dt. 25/07/2022
Contractor / Agency	Sri. Sreenivasa Reddy
Mix Type	Wet Mix Macadam
Material	Coarse Aggregates
Test Method	IS 2720 (Part 28):1974 (RA - 2010)
Source / Location	Site (IVR Road)
Sample No.	1 & 2
Date	19.07.2022

Sl. No.	Description	Test #1	Test #2
1	Offset	L	R
2	MDD	2.21	2.21
3	OMC in %	5.4	5.4
4	Bulk Density of Sand Ys	1.42	1.42
5	Weight of Sand in cone W1 (gm)	2832	2830
6	Weight of WMM from hole W2 (gm)	7585	7572
7	Wt. of Sand + Cylinder before pouring W3 (gm)	29677	29361
8	Wt. of Sand + Cylinder after pouring W4 (gm)	22154	21819
9	Wt. of Sand in hole: W5 = W3 - W4 - W1 (gm)	4691	4712
10	Volume of Hole: V = W5 / Ys	3303.52	3318.31
11	Bulk Density Yb = W2 / V (gm/cc)	2.30	2.28
12	F.M.C. (using rapid moisture meter)	4.20	4.00
13	Dry Density Yd = Yb / (1+W/100)	2.20	2.19
14	Field Compaction (%)	99.71	99.28

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Rate of Spread of Prime Coat

Project Name	Restoration and Improvements of Roads from Doddaballapura Main Road to Nagarjuna College, Kaveri Layout, Chowdappa Layout, Maruthinagara, Hariraja Layout and Surrounding Areas in Ward No - 03 of Yelahanka New Town Sub Division (PACKAGE NO -12)
Client	Executive Engineer, Yelahanka Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-5/BBMP/YHK/2022-23/54 Dt. 25/07/2022
Contractor / Agency	Sri. Sreenivasa Reddy
Mix Type	Bituminous Concrete
Material	S. S. Bitumen Emulsion
Test Method	AASHTO T 164 & AASHTO T 30
Source / Location	Site
Sample No.	1 & 2
Date	19.07.2022

Sl. No.	Description	Unit	Test #1		Test #2	
			Tray - 1	Tray - 2	Tray - 1	Tray - 2
1	Size of Plate (mxn)	m^2	0.45 x 0.45	0.45 x 0.45	0.45 x 0.45	0.45 x 0.45
2	Area of the Plate (a)	m^2	0.2025	0.2025	0.2025	0.2025
3	Initial weight of the empty plate (b)	kg	1.627	1.646	1.627	1.646
4	Final weight of plate after application of Prime Coat C	kg	1.750	1.772	1.751	1.771
5	Weight of Primer Coat (d = c-b)	kg	0.123	0.126	0.124	0.125
6	Rate of Spread (d/a)	kg / m^2	0.610	0.620	0.610	0.620
7	Average	kg / m^2	0.615		0.615	
8	Specified Limit	kg / m^2	Not Less than 0.6 kg / m^2			

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Project Management and Consultancy Services

Summary of Frequencies of Field and Laboratory Tests Conducted

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Job No.:	SCE/PMC/QCR-5/BBMP/YHK/2022-23/54 Dt. 25/07/2022
Contractor / Agency	Sri. Sreenivasa Reddy
Mix Type	Dense Bituminous Macadam

Sl. No.	Test Details	Quantity in m^3	Frequency of Tests	Tests Required	Tests Carried Out
1	Quality of Binder	146.03	1 Test / Lot	1	1
2	Aggregate Stripping Value		1 Test / Supply	1	1
3	Specific Gravity and Water Absorption of Aggregates		1 Test / Supply	1	1
4	Aggregate Impact Value		1 Test / 350 m^3	1	1
5	Combined Flakiness and Elongation Indices		1 Test / 350 m^3	1	1
6	Aggregate Gradation		2 Test / Day	1	1
7	Marshal Stability of the Mix		2 Tests / Day	1	1
8	Rate of Spread of Tack Coat		2 Tests / Day	1	1
9	Binder Content and Mix Gradation		2 Test / Day	1	1
10	Control of Temperature		Regular Intervals	-	-

Contractor / Agency

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Assistant Engineer

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Sapience Consultants and Engineers,

Assistant Executive Engineer

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Aggregate Stripping Value

Project Name	Restoration and Improvements of Roads from Doddaballapura Main Road to Nagarjuna College, Kaveri Layout, Chowdappa Layout, Maruthinagara, Hariraja Layout and Surrounding Areas in Ward No - 03 of Yelahanka New Town Sub Division (PACKAGE NO - 12)
Client	Executive Engineer, Yelahanka Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-5/BBMP/YHK/2022-23/54 Dt. 25/07/2022
Contractor / Agency	Sri. Sreenivasa Reddy
Mix Type	Dense Bituminous Macadam
Material	VG-30 grade Bitumen
Test Method	IS : 6241 - 1974 & Specification for Road & Bridge Works, MORTH, Revision - V
Type of binder	VG-30 grade Bitumen
% of Binder Used	4.50 % by weight
Weight of Aggregate	500 gms
Weight of Binder	22.50 gms
Water Bath Temp.	40° C
Source / Location	Plant
Sample No.	1
Date	12.07.2022

Observation No	Stripping Percentage	Average Percentage	Average Retained Coating (%)
1	3.42	3.58	96.11
2	3.87		
3	3.46		

Comments: Minimum Allowable Aggregate Stripping Value for Bituminous Concrete is 95%

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Aggregate Impact Value

Project Name	Restoration and Improvements of Roads from Doddaballapura Main Road to Nagarjuna College, Kaveri Layout, Chowdappa Layout, Maruthinagara, Hariraja Layout and Surrounding Areas in Ward No - 03 of Yelahanka New Town Sub Division (PACKAGE NO - 12)
Client	Executive Engineer, Yelahanka Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-5/BBMP/YHK/2022-23/54 Dt. 25/07/2022
Contractor / Agency	Sri. Sreenivasa Reddy
Mix Type	Dense Bituminous Macadam
Material	Coarse Aggregates
Test Method	IS : 2386 (Part - IV) 1963
Source / Location	Plant
Sample No.	1
Date	13.07.2022

Sl. No.	Details	Test No.		Average Aggregate Impact Value
		1	2	
1	Weight of Empty Cylinder (in gms) W1	868	868	18.50%
2	Weight of cylinder filled with sample (in gms) W2	1170	1155	
3	Weight of Sample (in gms) = (W2 - W1) W3	302	287	
4	Weight of Sample passing through 2.36mm IS sieve after impact (in gms) W4	52	57	
5	Weight of Sample retained in 2.36mm IS sieve after impact (in gms) W5	250	230	
6	Aggregate Impact Value in Percentage	17.00%	20.00%	

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 27% (MORTH table no.500.16)

For Sapience Consultants and Engineers

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Rate of Spread of Tack Coat

Project Name	Restoration and Improvements of Roads from Doddaballapura Main Road to Nagarjuna College, Kaveri Layout, Chowdappa Layout, Maruthinagara, Hariraja Layout and Surrounding Areas in Ward No - 03 of Yelahanka New Town Sub Division (PACKAGE NO -12)
Client	Executive Engineer, Yelahanka Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-5/BBMP/YHK/2022-23/54 Dt. 25/07/2022
Contractor / Agency	Sri. Sreenivasa Reddy
Mix Type	80/100 grade bitumen(VG10)
Material	Tack Coat
Test Method	AASHTO T 164 & AASHTO T 30
Source / Location	Site
Sample No.	1 & 2
Date	19.07.2022

Sl. No.	Description	Unit	Test #1		Test #2	
			Tray - 1	Tray - 2	Tray - 1	Tray - 2
1	Size of Plate (mxn)	m^2	0.3 x 0.3	0.3 x 0.3	0.3 x 0.3	0.3 x 0.3
2	Area of the Plate (a)	m^2	0.09	0.09	0.09	0.09
3	Initial weight of the empty plate (b)	kg	2.787	2.853	2.787	2.853
4	Final weight of plate after application of Tack Coat C	kg	2.809	2.877	2.810	2.876
5	Weight of Tack Coat (d = c-b)	kg	0.022	0.024	0.023	0.023
6	Rate of Spread (d/a)	kg / m^2	0.24	0.27	0.26	0.26
7	Average	kg / m^2	0.26		0.26	
8	Specified Limit	kg / m^2	Not Less than 0.25 kg / m^2			

For Sapience Consultants and Engineers,

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Quality of Binder

Project Name	Restoration and Improvements of Roads from Doddaballapura Main Road to Nagarjuna College, Kaveri Layout, Chowdappa Layout, Maruthinagara, Hariraja Layout and Surrounding Areas in Ward No - 03 of Yelahanka New Town Sub Division (PACKAGE NO - 12)
Client	Executive Engineer, Yelahanka Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-5/BBMP/YHK/2022-23/54Dt. 25/07/2022
Contractor / Agency	Sri. Sreenivasa Reddy
Mix Type	Bituminous Concrete
Material	VG-30 grade Bitumen
Source / Location	Plant
Date	11.07.2022

The results of the tests conducted on the bitumen sample using for VG-30 Bitumen

Sl. No	Description	Test #1	Test #2	Requirement as per IS:73:2013
1	Penetration at 25 °C, 1/10 mm	62	63	50 - 70
2	Softening point, °C	60.3	59.6	> 47
3	Specific Gravity	1.6	1 5	Min 0.97
4	Ductility at 25°C, cm	95	97	> 40
5	Flash Point, °C	320	314	> 220

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Specific Gravity and Water Absorption

Project Name	Restoration and Improvements of Roads from Doddaballapura Main Road to Nagarjuna College, Kaveri Layout, Chowdappa Layout, Maruthinagara, Hariraja Layout and Surrounding Areas in Ward No - 03 of Yelahanka New Town Sub Division (PACKAGE NO - 12)
Client	Executive Engineer, Yelahanka Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-5/BBMP/YHK/2022-23/54 Dt. 25/07/2022
Contractor / Agency	Sri. Sreenivasa Reddy
Mix Type	Bituminous Concrete
Material	Coarse Aggregates
Test Method	IS 2386(Part 3):1963
Source / Location	Plant
Sample No.	1
Date	14.07.2022

Sl. No.	Description	Notion	Test #1	Test #2	Test #3	Mean Value
1	Weight of aggregate suspended in water with the basket	W_1 g	2022	2020	2023	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_3$ g	1267	1265	1268	
4	Weight of saturated surface dry aggregate in air	W_3 g	2011	2010	2011	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_5)$ g	744	745	743	
6	Weight of oven dried aggregate	W_4 g	1998	1999	2000	
7	Specific Gravity	$W_4/(W_3-W_5)$	2.685	2.683	2.692	2.69
8	Apparent Specific Gravity	$W_4/(W_4-W_5)$	2.733	2.723	2.732	2.73
9	Water Absorption	$((W_3 - W_4) * 100)/W_4$	0.65%	0.55%	0.55%	0.58%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0% (MORTH table 500.16)

Note:

→ This test report should not be reproduced except in full, without written approval of the laboratory
→ The results indicated above are based on the tests carried out on the samples received in the laboratory
→ Any Query regarding the report must be reported within 15 days from the date of testing.

For SAPIENCE Consultants and Engineers,

SAPIENCE CONSULTANTS & ENGINEERS ★ Bangalore-59

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Aggregate Impact Value

Project Name	Restoration and Improvements of Roads from Doddaballapura Main Road to Nagarjuna College, Kaveri Layout, Chowdappa Layout, Maruthinagara, Hariraja Layout and Surrounding Areas in Ward No - 03 of Yelahanka New Town Sub Division (PACKAGE NO - 12)
Client	Executive Engineer, Yelahanka Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-5/BBMP/YHK/2022-23/54 Dt. 25/07/2022
Contractor / Agency	Sri. Sreenivasa Reddy
Mix Type	Bituminous Concrete
Material	Coarse Aggregates
Test Method	IS : 2386 (Part - IV) 1963
Source / Location	Plant
Sample No.	2
Date	14.07.2022

Sl. No.	Details	Test No.		Average Aggregate Impact Value
		1	2	
1	Weight of Empty Cylinder (in gms) W1	868	868	13.50%
	Weight of cylinder filled with sample (in gms) W2	1166	1172	
2	Weight of Sample (in gms) = (W2 - W1) W3	298	304	
	Weight of Sample passing through 2.36mm IS sieve after impact (in gms) W4	40	44	
	Weight of Sample retained in 2.36mm IS sieve after impact (in gms) W5	258	260	
3	Aggregate Impact Value in Percentage	13.00%	14.00%	

Comments:
→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%(MORTH table no.500.16)

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Aggregate Particle Shape

Project Name	Restoration and Improvements of Roads from Doddaballapura Main Road to Nagarjuna College, Kaveri Layout, Chowdappa Layout, Maruthinagara, Hariraja Layout and Surrounding Areas in Ward No - 03 of Yelahanka New Town Sub Division (PACKAGE NO - 12)
Client	Executive Engineer, Yelahanka Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-5/BBMP/YHK/2022-23/54 Dt. 25/07/2022
Contractor / Agency	Sri. Sreenivasa Reddy
Mix Type	Bituminous Concrete
Material	Coarse Aggregates
Test Method	IS 2386(Part 1) 1963 (RA 2011)
Source / Location	Plant
Sample No.	2
Date	16.07.2022

Sl. No.	Test	1	2	Requirements as per MORTH 5th edition table no 500.16
1	Flakiness Index	11.30	11.90	Combined Flakiness & Elongation index Max 35%
2	Elongation Index	11.00	10.20	
3	Combined Flakiness & Elongation index	22.30	22.10	

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Marshall Stability

Project Name	Restoration and Improvements of Roads from Doddaballapura Main Road to Nagarjuna College, Kaveri Layout, Chowdappa Layout, Maruthinagara, Hariraja Layout and Surrounding Areas in Ward No - 03 of Yelahanka New Town Sub Division (PACKAGE NO - 12)
Client	Executive Engineer, Yelahanka Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-5/BBMP/YHK/2022-23/54 Dt. 25/07/2022
Contractor / Agency	Sri. Sreenivasa Reddy
Mix Type	Bituminous Concrete
Material	Coarse Aggregates
Test Method	IS 2386(Part 3):1963
Source / Location	Plant
Sample No.	1 & 2
Date	14.07.2022

Sl. No.	Properties	Test #1	Test #2	Requirement as per MORTH (Table 500-19)
1	Marshall Stability value at 600C in KGs	1319.00	1314.00	> 900
2	Marshal flow, mm	2.53	3.70	2 - 4
3	Percent air voids in Mineral Aggregate	3.24	4.24	13 - 15
4	Voids in Compacted Mix	4.21	4.82	3 - 6
5	Percent voids in mineral aggregate (VMA)	11.88	11.93	11 - 13
6	Density, g/cc	2.63	2.25	—

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Rate of Spread of Tack Coat

Project Name	Restoration and Improvements of Roads from Doddaballapura Main Road to Nagarjuna College, Kaveri Layout, Chowdappa Layout, Maruthinagara, Hariraja Layout and Surrounding Areas in Ward No - 03 of Yelahanka New Town Sub Division (PACKAGE NO - 12)
Client	Executive Engineer, RI - Mahadevapura Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-5/BBMP/YHK/2022-23/54 Dt. 25/07/2022
Contractor / Agency	Sri. M RAMESH
Mix Type	Bituminous Concrete
Material	EMULSION
Test Method	AASHTO T 164 & AASHTO T 30
Source / Location	Site
Sample No.	3 & 4
Date	22.07.2022

Sl. No.	Description	Unit	Test #3		Test #4	
			Tray - 1	Tray - 2	Tray - 1	Tray - 2
1	Size of Plate (mxn)	m^2	0.3 x 0.3	0.3 x 0.3	0.3 x 0.3	0.3 x 0.3
2	Area of the Plate (a)	m^2	0.09	0.09	0.09	0.09
3	Initial weight of the empty plate (b)	kg	2.787	2.853	2.787	2.853
4	Final weight of plate after application of Tack Coat C	kg	2.809	2.877	2.811	2.874
5	Weight of Tack Coat (d = c-b)	kg	0.022	0.024	0.024	0.021
6	Rate of Spread (d/a)	kg / m^2	0.24	0.27	0.27	0.23
7	Average	kg / m^2	0.26		0.25	
8	Specified Limit	kg / m^2	Not Less than 0.25 kg / m^2			

Note:

→ This test report should not be reproduced except in full, without written approval of the laboratory

→ The results indicated above are based on the tests carried out on the samples received in the laboratory

→ Any Query regarding the report must be reported within 15 days from the date of testing.

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Binder Content and Mix Gradation

Project Name	Restoration and Improvements of Roads from Doddaballapura Main Road to Nagarjuna College, Kaveri Layout, Chowdappa Layout, Maruthinagara, Hariraja Layout and Surrounding Areas in Ward No - 03 of Yelahanka New Town Sub Division (PACKAGE NO - 12)
Client	Executive Engineer, Yelahanka Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-5/BBMP/YHK/2022-23/54 Dt. 25/07/2022
Contractor / Agency	Sri. Sreenivasa Reddy
Mix Type	Bituminous Concrete
Material	Bituminous Concrete Mix
Test Method	AASHTO T 164 & AASHTO T 30
Source / Location	Site
Sample No.	1 & 2
Date	18.07.2022

Sl. No.	Description	Test #1	Test #2
1	Weight of mix before extraction = M in gms.	500.00	500.00
2	Wt. of filter paper before extraction =P1 in gms.	4.00	4.00
3	Wt. of filter paper after extraction =P2 in gms.	4.00	5.00
4	Quantity of Dry Aggregates deposited on filter paper a1= P2-P1 in gms.	0.00	1.00
5	Wt. of Dry Aggregates in the extractor container a2 in gms.	471.00	472.00
6	Total Wt. of Dry Aggregates A = a1+a2 in gms.	471.00	473.00
7	Wt. of Bitumen B= M-A in gms.	29.00	27.00
8	% of Bitumen Content (B/M)x100	5.80	5.40

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Binder Content and Mix Gradation

Project Name	Restoration and Improvements of Roads from Doddaballapura Main Road to Nagarjuna College, Kaveri Layout, Chowdappa Layout, Maruthinagara, Hariraja Layout and Surrounding Areas in Ward No - 03 of Yelahanka New Town Sub Division (PACKAGE NO -12)
Client	Executive Engineer, Yelahanka Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-5/BBMP/YHK/2022-23/54 Dt. 25/07/2022
Contractor / Agency	Sri. Sreenivasa Reddy
Mix Type	Bituminous Concrete
Material	Coarse Aggregates
Test Method	AASHTO T 164 & AASHTO T 30
Source / Location	Site
Sample No.	1 & 2
Date	18.07.2022

Weight of Sample after test (gms) : **471.00**

Sieve Size (mm)	Weight Retained in gms	Cumulative Weight Retained	Cummulative % Retained	Cumulative % Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies the MORTH Grade-II Specification for Bituminous Concrete
13.2	28.2	28.2	5.99	94.01	90 - 100	
9.5	75.6	103.8	22.04	77.96	70 - 88	
4.75	88.0	191.8	40.72	59.28	53 - 71	
2.36	53.9	245.7	52.17	47.83	42 - 58	
1.18	37.1	282.8	60.04	39.96	34 - 48	
0.600	48.6	331.4	70.36	29.64	26 - 38	
0.300	44.1	375.5	79.72	20.28	18 - 28	
0.150	26.6	402.1	85.37	14.63	12 - 20	
0.075	43.2	445.3	94.54	5.46	4 - 10	

Weight of Sample after test (gms) : **472.00**

Sieve Size (mm)	Weight Retained in gms	Cumulative Weight Retained	Cummulative % Retained	Cumulative % Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies the MORTH Grade-II Specification for Bituminous Concrete
13.2	21.4	21.4	4.53	95.47	90 - 100	
9.5	69.4	90.8	19.24	80.76	70 - 88	
4.75	108.2	199.0	42.16	57.84	53 - 71	
2.36	51.7	250.7	53.11	46.89	42 - 58	
1.18	21.8	272.5	57.73	42.27	34 - 48	
0.600	47.2	319.7	67.73	32.27	26 - 38	
0.300	31.2	350.9	74.34	25.66	18 - 28	
0.150	37.8	388.7	82.35	17.65	12 - 20	
0.075	57.4	446.1	94.51	5.49	4 - 10	

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Binder Content and Mix Gradation

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Client	Executive Engineer, Yelahanka Division, BBMP, Bangalore.
Job No.:	SCE/PMC/QCR-5/BBMP/YHK/2022-23/54 Dt. 25/07/2022
Contractor / Agency	Sri. Sreenivasa Reddy
Mix Type	Bituminous Concrete
Material	Bituminous Concrete Mix
Test Method	AASHTO T 164 & AASHTO T 30
Source / Location	Site
Sample No.	3 & 4
Date	19.07.2022

Sl. No.	Description	Test #3	Test #4
1	Weight of mix before extraction = M in gms.	500.00	500.00
2	Wt. of filter paper before extraction =P1 in gms.	4.00	4.00
3	Wt. of filter paper after extraction =P2 in gms.	4.00	5.00
4	Quantity of Dry Aggregates deposited on filter paper a1= P2-P1 in gms.	0.00	1.00
5	Wt. of Dry Aggregates in the extractor container a2 in gms.	472.00	472.00
6	Total Wt. of Dry Aggregates A = a1+a2 in gms.	472.00	473.00
7	Wt. of Bitumen B= M-A in gms.	28.00	27.00
8	% of Bitumen Content (B/M)x100	5.60	5.40

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Job No.:	SCE/PMC/QCR-5/BBMP/YHK/2022-23/54 Dt. 25/07/2022
Contractor / Agency	Sri. Sreenivasa Reddy
Mix Type	Bituminous Concrete
Material	Coarse Aggregates
Test Method	AASHTO T 164 & AASHTO T 30
Source / Location	Site
Sample No.	3 & 4
Date	19.07.2022

Weight of Sample after test (gms) : **472.00**

Sieve Size (mm)	Weight Retained in gms	Cumulative Weight Retained	Cummulative % Retained	Cumulative % Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies the MORTH Grade-II Specification for Bituminous Concrete
13.2	15.4	15.4	3.26	96.74	90 - 100	
9.5	83.5	98.9	20.95	79.05	70 - 88	
4.75	101.6	200.5	42.48	57.52	53 - 71	
2.36	51.4	251.9	53.37	46.63	42 - 58	
1.18	25.1	277.0	58.69	41.31	34 - 48	
0.600	62.7	339.7	71.97	28.03	26 - 38	
0.300	22.1	361.8	76.65	23.35	18 - 28	
0.150	42.8	404.6	85.72	14.28	12 - 20	
0.075	32.7	437.3	92.65	7.35	4 - 10	

Weight of Sample after test (gms) : **472.00**

Sieve Size (mm)	Weight Retained in gms	Cumulative Weight Retained	Cummulative % Retained	Cumulative % Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies the MORTH Grade-II Specification for Bituminous Concrete
13.2	16.0	16.0	3.39	96.61	90 - 100	
9.5	92.2	108.2	22.92	77.08	70 - 88	
4.75	72.2	180.4	38.22	61.78	53 - 71	
2.36	52.5	232.9	49.34	50.66	42 - 58	
1.18	48.6	281.5	59.64	40.36	34 - 48	
0.600	37.9	319.4	67.67	32.33	26 - 38	
0.300	51.3	370.7	78.54	21.46	18 - 28	
0.150	33.2	403.9	85.57	14.43	12 - 20	
0.075	39.6	443.5	93.96	6.04	4 - 10	

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